

## SEQUENCE LISTING

<110> Falco, S. Carl  
Allen, Stephen M.

<120> Plant Amino Acid Biosynthetic Enzymes

<130> BB1116 US CIP

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<150> 09/424,976

<151> 1999-12-02

<150> 60/065,385

<151> 1997-11-12

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<151> 1997-06-12

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 35 40 45  
 Thr Cys Asn Ile Phe Ser Gln Gln Tyr Ala Phe Asn Ile Phe Ser His  
 50 55 60  
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 Val Lys Glu Thr Arg Lys Ile Trp Asn Asp Lys Asp Val Arg Val Thr  
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 100 105 110  
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 35 40 45  
 Gly Ala Val Gly Gln Glu Phe Leu Ser Val Leu Ser Asp Arg Asp Phe  
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Ile	Asn	Pro	Asp	Val	Asp	Pro	Gln	Val	His	Pro	Tyr	Val	Ala	Thr	Gly
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Asn	Lys	Thr	Ser	Lys	Phe	Gly	Ile	Arg	Asn	Glu	Lys	Leu	Gln	Trp	Phe
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Leu	Asp	Ser	Ile	Lys	Ser	Tyr	Pro	Asn	Glu	Ile	Lys	Leu	Val	Gly	Val
				85					90					95	
His	Cys	His	Leu	Gly	Ser	Thr	Ile	Thr	Lys	Val	Asp	Ile	Phe	Arg	Asp
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Ala	Ala	Val	Leu	Met	Leu	Asn	Tyr	Val	Asp	Glu	Ile	Arg	Ala	Gln	Gly
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Gly	Arg	Ser	Leu	Ile	Ala	Asn	Thr	Cys	Cys	Phe	Val	Asn	Arg	Val	Thr
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225				230						235					240

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Glu Leu Pro Thr Pro Asp Glu Gly Ala Gly Leu Val Val His Asp Ala  
260 265 270

Gly Ala Tyr Cys Met Ser Met Ala Ser Thr Tyr Asn Leu Lys Leu Arg  
275 280 285

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<213> Zea mays

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Leu	Val	Gly	Ala	His	Cys	His	Leu	Gly	Ser	Thr	Ile	Thr	Lys	Val	Asp
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Ile	Phe	Arg	Asp	Ala	Ala	Thr	Ile	Met	Ile	Asn	Tyr	Ile	Asp	Gln	Ile
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Arg	Asp	Gln	Gly	Phe	Glu	Val	Asp	Tyr	Leu	Asn	Ile	Gly	Gly	Gly	Leu
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Gly	Ile	Asp	Tyr	Tyr	His	Ser	Gly	Ala	Ile	Leu	Pro	Thr	Pro	Arg	Asp
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 Tyr Gln His Ile Glu Leu Val Ser Pro Ala Pro Ser Asn Ala Glu Thr  
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 Glu Thr Phe Asp Val Val Gly Pro Val Cys Glu Ser Ala Asp Phe Leu  
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 Gly Lys Gly Arg Glu Leu Pro Thr Pro Ala Lys Gly Thr Gly Leu Val  
 195 200 205  
 Val His Asp Ala Gly Ala Tyr Cys Met Ser Met Ala Ser Thr Tyr Asn  
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 Leu Lys Met Arg Pro Pro Glu Tyr Trp Val Glu Asp Asp Gly Ser Val  
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35 40 45

Leu Gly Cys Gly Ala Val Leu Val Ser Gly Asn Glu Leu Lys  
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35 40 45

Lys Asp Ile Ala Pro Leu Lys Asp Ala Tyr Ser Ile Asp Glu Leu Lys  
50 55 60

Thr Leu Asp Val Ile Leu Thr Cys Gln Gly Gly Asp Tyr Thr Ser Glu  
65 70 75 80

Val Phe Pro Lys Leu Arg Glu Ala Gly Trp Gln Gly Tyr Trp Ile Asp  
85 90 95

Ala Ala Ser Ser Leu Arg Met Glu Asp Asp Ala Val Ile Val Leu Asp  
100 105 110

Pro Val Asn Arg Lys Val Ile Asp Gln Ala Leu Asp Ala Gly Thr Arg  
115 120 125

Asn Tyr Ile Gly Gly Asn Cys Thr Val Ser Leu Met Leu Met Ala Leu  
130 135 140

Gly Gly Leu Phe Asp Ala Gly Leu Val Glu Trp Met Ser Ala Met Thr  
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Tyr Gln Ala Ala Ser Gly Ala Gly Ala Gln Asn Met Arg Asp Leu Leu  
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<210> 22  
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 35 40 45  
 Met Arg Ala Ala Leu Pro Arg Gln Val Asp Val Gln Gln His Val Arg  
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 Asn Ser Ser Gln Ala Ala Ala Leu Val Ala Ala Val Leu Gln Gly Asp  
 65 70 75 80  
 Ala Gly Leu Ile Gly Ser Ala Met Ser Ser Asp Gly Ile Val Glu Pro  
 85 90 95  
 Thr Arg Ala Pro Leu Ile Pro Gly Met Ala Ala Val Lys Ala Ala Ala  
 100 105 110  
 Leu Gln Ala Gly Ala Leu Gly Cys Thr Ile Ser Gly Ala Gly Pro Thr  
 115 120 125  
 Val Val Ala Val Ile Gln Gly Glu Glu Arg Gly Glu Glu Val Ala Arg  
 130 135 140  
 Lys Met Val Asp Ala Phe Trp Ser Ala Gly Lys Leu Lys Ala Thr Ala  
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 Thr Val Ala Gln Leu Asp Thr Leu Gly Ala Arg Val Ile Ala Thr Ser  
 165 170 175  
 Ser Leu Asn

<210> 23  
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 <212> DNA  
 <213> Oryza sativa

<220>  
 <221> unsure  
 <222> (433)

<220>  
 <221> unsure  
 <222> (600)

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 gctgccaagg ccgttgacgc cctcttcggc tccctcctac accaagatga cctcgctcctc 180  
 gcgggcctcg agtccgagaa agccgtcagt ggcttccacg ccgacaacat cgccccggcc 240

atcctcggcg	gcttcgtcct	cgtcgcgagc	taagacccct	tccacctcat	cccgtctctc	300
tccccacctg	ccctccgcct	ccacttcgtc	ctcgtcacgc	ccgacttcga	ggcgcccacc	360
aagcaagatg	cgtgccgcgc	tgcccaaaca	ggtggccgtc	caccaagcac	gtccgcaact	420
ccagccaagc	ggncgcgctt	gtcgccgctg	tgctgcaagg	ggacgccacc	ctcatcggct	480
ccgcaatgtc	ctccgacggc	atcgtggagc	caacaaggcg	ccgctgattc	tggatggctg	540
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 <211> 82  
 <212> PRT  
 <213> Oryza sativa

<220>  
 <221> UNSURE  
 <222> (56)

<220>  
 <221> UNSURE  
 <222> (57)

<400> 24  
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 Phe Gly Ser Leu Leu His Gln Asp Asp Leu Val Leu Ala Gly Leu Glu  
 35 40 45  
 Ser Glu Lys Ala Val Ser Gly Xaa Xaa His Ala Asp Asn Ile Ala Pro  
 50 55 60  
 Ala Ile Leu Gly Gly Phe Val Leu Val Arg Ser Tyr Asp Pro Phe His  
 65 70 75 80  
 Leu Ile

<210> 25  
 <211> 1543  
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 <213> Glycine max

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gtcgggtcaat	attcgaaggg	agcccgaacc	tgtaacgacg	ctggtgaaag	cgtttgctcc	180
cgccacggtg	gcgaatctag	gtccaggctt	cgacttccta	ggctgcgccg	tggacggact	240
cggagacatt	gtgtcgggtga	aggttgaccc	acaggttcac	cctggcgaga	tatgcatatc	300
cgacatcagc	ggccacgccc	caaacaagct	cagcaaaaac	cctctctgga	actgcgccgg	360
catcgccgcc	attgaagtca	tgaaaatgct	ctccattcga	tccgtcggcc	tctccctctc	420
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ggccgccgtg	gcggtgaacg	agctgttttg	gaagaaatta	agcgtggagg	agctggttct	540
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gataatgggg	ggttttgtgc	tgatcgggag	ctactcgccg	ctggagttga	tgccgttgaa	660
gtttccggca	gagaaggagc	tgtatttcgt	gctgggtgacg	cctgagttcg	aggccccgac	720
gaagaagatg	cgggcagcgc	tgccctacga	gatcgggatg	ccgcaccacg	tgtggaactg	780
cagccaggca	ggtgctctgg	tggcgctcgt	gctgcagggc	gacgtgggtg	ggttggggaa	840

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ggcattgtcc tctgacaaga tcgttgagcc aaggcgtgcc cccttgattc ctggcatgga 900
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tgaatagcat gtattgttcc ttaaaaaaaaa aaaaaaaaaa aaa 1543

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<210> 26  
 <211> 483  
 <212> PRT  
 <213> Glycine max

<400> 26

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Gly Arg Ala Arg Phe Arg Ile Arg Ile Arg Cys Ser Ser Ser Val Ser
          20          25          30

Val Asn Ile Arg Arg Glu Pro Glu Pro Val Thr Thr Leu Val Lys Ala
          35          40          45

Phe Ala Pro Ala Thr Val Ala Asn Leu Gly Pro Gly Phe Asp Phe Leu
          50          55          60

Gly Cys Ala Val Asp Gly Leu Gly Asp Ile Val Ser Val Lys Val Asp
65          70          75          80

Pro Gln Val His Pro Gly Glu Ile Cys Ile Ser Asp Ile Ser Gly His
          85          90          95

Ala Pro Asn Lys Leu Ser Lys Asn Pro Leu Trp Asn Cys Ala Gly Ile
          100          105          110

Ala Ala Ile Glu Val Met Lys Met Leu Ser Ile Arg Ser Val Gly Leu
          115          120          125

Ser Leu Ser Leu Glu Lys Gly Leu Pro Leu Gly Ser Gly Leu Gly Ser
          130          135          140

Ser Ala Ala Ser Ala Ala Ala Ala Val Ala Val Asn Glu Leu Phe
145          150          155          160

Gly Lys Lys Leu Ser Val Glu Glu Leu Val Leu Ala Ser Leu Lys Ser
          165          170          175

Glu Glu Lys Val Ser Gly Tyr His Ala Asp Asn Val Ala Pro Ser Ile
          180          185          190

Met Gly Gly Phe Val Leu Ile Gly Ser Tyr Ser Pro Leu Glu Leu Met
          195          200          205

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Pro	Leu	Lys	Phe	Pro	Ala	Glu	Lys	Glu	Leu	Tyr	Phe	Val	Leu	Val	Thr	210	215	220	
Pro	Glu	Phe	Glu	Ala	Pro	Thr	Lys	Lys	Met	Arg	Ala	Ala	Leu	Pro	Thr	225	230	235	240
Glu	Ile	Gly	Met	Pro	His	His	Val	Trp	Asn	Cys	Ser	Gln	Ala	Gly	Ala	245	250	255	
Leu	Val	Ala	Ser	Val	Leu	Gln	Gly	Asp	Val	Val	Gly	Leu	Gly	Lys	Ala	260	265	270	
Leu	Ser	Ser	Asp	Lys	Ile	Val	Glu	Pro	Arg	Arg	Ala	Pro	Leu	Ile	Pro	275	280	285	
Gly	Met	Glu	Ala	Val	Lys	Arg	Ala	Ala	Ile	Gln	Ala	Gly	Ala	Phe	Gly	290	295	300	
Cys	Thr	Ile	Ser	Gly	Ala	Gly	Pro	Thr	Ala	Val	Ala	Val	Ile	Asp	Asp	305	310	315	320
Glu	Gln	Thr	Gly	His	Leu	Ile	Ala	Lys	His	Met	Ile	Asp	Ala	Phe	Leu	325	330	335	
His	Val	Gly	Asn	Leu	Lys	Ala	Ser	Ala	Asn	Val	Lys	Gln	Leu	Asp	Arg	340	345	350	
Leu	Gly	Ala	Arg	Arg	Ile	Pro	Asn	Thr	Phe	Ser	Ser	Leu	Ser	Leu	Glu	355	360	365	
Ala	Cys	Arg	Phe	Gln	Glu	Pro	Asp	Phe	Phe	Gln	Leu	Ala	Arg	Asn	Thr	370	375	380	
Leu	Ser	Ala	Asp	Arg	Ser	His	Val	Phe	Glu	Ile	Ser	Asp	Gln	Ser	Ser	385	390	395	400
Ile	Leu	Val	Trp	Arg	Ser	Glu	Gln	Glu	Lys	His	Thr	Gln	Ala	Gly	Ser	405	410	415	
Ser	Val	Trp	Val	Val	Glu	Ile	Ile	Asp	Glu	Leu	Lys	Thr	Ile	Arg	Ser	420	425	430	
Val	Leu	Trp	Thr	Leu	Lys	His	Val	Leu	Asp	Phe	Leu	Cys	Phe	Val	Phe	435	440	445	
Ile	Ile	Phe	Leu	Ser	Cys	Tyr	Leu	Ser	Gln	Ser	Ser	Lys	Arg	Ser	His	450	455	460	
Phe	Tyr	Phe	Leu	Val	Ser	Leu	Cys	Leu	Ile	Leu	Ala	Phe	Glu	His	Val	465	470	475	480
Leu	Phe	Leu																	

<220>  
 <221> unsure  
 <222> (271)

<220>  
 <221> unsure  
 <222> (421)

<220>  
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 ccagcgctcc gctccactt cgtcctggc acccccgact tcgaggcgcc cacgagcaag 180  
 atgcgcgccg cgctgcccag gcaggtcgac gtccagcagc acgtgcgcaa ctccagccag 240  
 gcagcggcgc tccgtggcgg cgggtgctgca nggggacgcc gggctcatcg gtccgcgatt 300  
 tctccgacgg gcatcgtgga cccaccaagg aaccctcata cctggcatgg cggccgtaaa 360  
 ggcggcggcc tgcaactgga cgctgggtgc acattaacgg gcgggcccac atggtggctc 420  
 ncagngaaga gaggggag 438

<210> 28  
 <211> 84  
 <212> DNA  
 <213> Triticum aestivum

<400> 28  
 Leu Glu Ser Glu Lys Ala Val Ser Gly Phe His Ala Asp Asn Ile Ala  
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 Pro Ala Ile Leu Gly Gly Phe Val Leu Val Arg Ser Tyr Asp Pro Phe  
 20 25 30  
 His Leu Val Pro Leu Ser Phe Pro Pro Ala Leu Arg Leu His Phe Val  
 35 40 45  
 Leu Val Thr Pro Asp Phe Glu Ala Pro Thr Ser Lys Met Arg Ala Ala  
 50 55 60  
 Leu Pro Arg Gln Val Asp Val Gln Gln His Val Arg Asn Ser Ser Gln  
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 Ala Ala Ala Leu

<210> 29  
 <211> 300  
 <212> PRT  
 <213> Methanococcus jannashii

<400> 29  
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 Asn Leu Gly Val Gly Phe Asp Val Phe Gly Leu Cys Leu Lys Glu Pro  
 20 25 30  
 Tyr Asp Val Ile Glu Val Glu Ala Ile Asp Asp Lys Glu Ile Ile Ile  
 35 40 45

Glu	Val	Asp	Asp	Lys	Asn	Ile	Pro	Thr	Asp	Pro	Asp	Lys	Asn	Val	Ala	
50						55					60					
Gly	Ile	Val	Ala	Lys	Lys	Met	Ile	Asp	Asp	Phe	Asn	Ile	Gly	Lys	Gly	
65					70				75						80	
Val	Lys	Ile	Thr	Ile	Lys	Lys	Gly	Val	Lys	Ala	Gly	Ser	Gly	Leu	Gly	
				85				90						95		
Ser	Ser	Ala	Ala	Ser	Ser	Ala	Gly	Thr	Ala	Tyr	Ala	Ile	Asn	Glu	Leu	
		100						105					110			
Phe	Lys	Leu	Asn	Leu	Asp	Lys	Leu	Lys	Leu	Val	Asp	Tyr	Ala	Ser	Tyr	
		115					120					125				
Gly	Glu	Leu	Ala	Ser	Ser	Gly	Ala	Lys	His	Ala	Asp	Asn	Val	Ala	Pro	
		130				135					140					
Ala	Ile	Phe	Gly	Gly	Phe	Thr	Met	Val	Thr	Asn	Tyr	Glu	Pro	Leu	Glu	
145					150					155					160	
Val	Leu	His	Ile	Pro	Ile	Asp	Phe	Lys	Leu	Asp	Ile	Leu	Ile	Ala	Ile	
				165					170					175		
Pro	Asn	Ile	Ser	Ile	Asn	Thr	Lys	Glu	Ala	Arg	Glu	Ile	Leu	Pro	Lys	
			180					185					190			
Ala	Val	Gly	Leu	Lys	Asp	Leu	Val	Asn	Asn	Val	Gly	Lys	Ala	Cys	Gly	
		195					200					205				
Met	Val	Tyr	Ala	Leu	Tyr	Asn	Lys	Asp	Lys	Ser	Leu	Phe	Gly	Arg	Tyr	
		210				215					220					
Met	Met	Ser	Asp	Lys	Val	Ile	Glu	Pro	Val	Arg	Gly	Lys	Leu	Ile	Pro	
225					230					235					240	
Asn	Tyr	Phe	Lys	Ile	Lys	Glu	Glu	Val	Lys	Asp	Lys	Val	Tyr	Gly	Ile	
				245					250					255		
Thr	Ile	Ser	Gly	Ser	Gly	Pro	Ser	Ile	Ile	Ala	Phe	Pro	Lys	Glu	Glu	
			260					265					270			
Phe	Ile	Asp	Glu	Val	Glu	Asn	Ile	Leu	Arg	Asp	Tyr	Tyr	Glu	Asn	Thr	
		275					280					285				
Ile	Arg	Thr	Glu	Val	Gly	Lys	Gly	Val	Glu	Val	Val					
		290				295					300					

  

<210>	30	
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<212>	DNA	
<213>	Glycine max	

  

<400>	30					
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atgttacgga	attgattggt	aaaaccccat	tagtatatct	aaataaactt	gcggatgggt	180
gtgttgccccg	ggttgctgct	aaactggagt	tgatggagcc	atgctctagt	gtgaaggaca	240



Asp Ala Phe Val Ser Gly Ile Gly Thr Gly Gly Thr Ile Thr Gly Ala  
 180 185 190  
 Gly Lys Tyr Leu Lys Glu Gln Asn Pro Asn Ile Lys Leu Ile Gly Val  
 195 200 205  
 Glu Pro Val Glu Ser Pro Val Leu Ser Gly Gly Lys Pro Gly Pro His  
 210 215 220  
 Lys Ile Gln Gly Ile Gly Ala Gly Phe Ile Pro Gly Val Leu Glu Val  
 225 230 235 240  
 Asn Leu Leu Asp Glu Val Val Gln Ile Ser Ser Asp Glu Ala Ile Glu  
 245 250 255  
 Thr Ala Lys Leu Leu Ala Leu Lys Glu Gly Leu Phe Val Gly Ile Ser  
 260 265 270  
 Ser Gly Ala Ala Ala Ala Ala Ala Phe Gln Ile Ala Lys Arg Pro Glu  
 275 280 285  
 Asn Ala Gly Lys Leu Ile Val Ala Val Phe Pro Ser Phe Gly Glu Arg  
 290 295 300  
 Tyr Leu Ser Ser Val Leu Phe Glu Ser Val Arg Arg Glu Ala Glu Ser  
 305 310 315 320  
 Met Thr Phe Glu Pro  
 325  
 <210> 32  
 <211> 325  
 <212> PRT  
 <213> Citrullus lanatus  
 <400> 32  
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 20 25 30  
 Ala Arg Val Ala Ala Lys Leu Glu Met Met Glu Pro Cys Ser Ser Val  
 35 40 45  
 Lys Asp Arg Ile Gly Tyr Ser Met Ile Ser Asp Ala Glu Asn Lys Gly  
 50 55 60  
 Leu Ile Thr Pro Gly Glu Ser Val Leu Ile Glu Pro Thr Ser Gly Asn  
 65 70 75 80  
 Thr Gly Ile Gly Leu Ala Phe Ile Ala Ala Ala Lys Gly Tyr Arg Leu  
 85 90 95  
 Ile Ile Cys Met Pro Ala Ser Met Ser Leu Glu Arg Arg Thr Ile Leu  
 100 105 110  
 Arg Ala Phe Gly Ala Glu Leu Val Leu Thr Asp Pro Ala Arg Gly Met  
 115 120 125





<210> 34  
 <211> 223  
 <212> PRT  
 <213> Zea mays

<400> 34  
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 Ser Pro Val Leu Ser Arg Pro Ile Glu Leu Gly Ala Asp Ile Val Met  
 20 25 30  
 His Ser Ala Thr Lys Phe Ile Ala Gly His Ser Asp Leu Met Ala Gly  
 35 40 45  
 Ile Leu Ala Val Lys Gly Glu Ser Leu Ala Lys Glu Val Gly Phe Leu  
 50 55 60  
 Gln Asn Ala Glu Gly Ser Gly Leu Ala Pro Phe Asp Cys Trp Leu Cys  
 65 70 75 80  
 Leu Arg Gly Ile Lys Thr Met Ala Leu Arg Val Glu Lys Gln Gln Ala  
 85 90 95  
 Asn Ala Gln Lys Ile Ala Glu Phe Leu Ala Ser His Pro Arg Val Lys  
 100 105 110  
 Gln Val Asn Tyr Ala Gly Leu Pro Asp His Pro Gly Arg Ala Leu His  
 115 120 125  
 Tyr Ser Gln Ala Lys Gly Ala Gly Ser Val Leu Ser Phe Leu Thr Gly  
 130 135 140  
 Ser Leu Ala Leu Ser Lys His Val Val Glu Thr Thr Lys Tyr Phe Ser  
 145 150 155 160  
 Val Thr Val Ser Phe Gly Ser Val Lys Ser Leu Ile Ser Leu Pro Cys  
 165 170 175  
 Phe Met Ser His Ala Ser Ile Pro Ala Ser Val Arg Glu Glu Arg Gly  
 180 185 190  
 Leu Thr Asp Asp Leu Val Arg Ile Ser Val Gly Ile Glu Asp Val Glu  
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 Asp Leu Ile Ala Asp Leu Asp Arg Ala Leu Arg Thr Gly Pro Val  
 210 215 220

<210> 35  
 <211> 547  
 <212> DNA  
 <213> Oryza sativa

<220>  
 <221> unsure  
 <222> (260)

[illegible][illegible][illegible][illegible][illegible][illegible][illegible]

**THE** **NEW** **YORK** **PUBLIC** **LIBRARY**

[illegible][illegible]

**THE** **NEW** **YORK** **PUBLIC** **LIBRARY**

[illegible][illegible]

<400> 36  
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 Gly Met Ala Ala Leu Ala Ala Val Thr His Leu Leu Lys Ser Gly Gln  
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 Glu Ile Val Ala Gly Glu Asp Ile Tyr Gly Gly Ser Asp Arg Leu Leu  
 35 40 45  
 Ser Gln Val Ala Pro Arg His Gly Ile Val Val Lys Arg Ile Asp Thr  
 50 55 60  
 Thr Lys Ile Ser Glu Val Thr Ser Ala Ile Gly  
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<210> 37  
 <211> 1733  
 <212> DNA  
 <213> Glycine max

<400> 37  
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 cttcagtccc tcgtcattga tcgttacgct cagagcacia ctgctgcaac caggtgggag 180  
 tgcttggggg ttaacaagtc agaaaatttc agtaccaaga gagtggtgag tgcagagggg 240  
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 ttggtggatg atgctgccat gagcttaagt gaagaggatt taggggagcc tagtatttca 360  
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 taccaaacgg ctacttttaa gcagccttct gcaatagaaa atggtcccta tgactatacc 480  
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 gaggttgctg ctgccattgg actcaggact aagcttggtg ggcttgagag tccaaccaat 780  
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 gccctgcgaa ttgaaaagca acaggataac gcacagaaga ttgcagagtt ccttgcctcc 1140  
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 gtgaagtccc tcattagcat gccatgcttt atgtcacatg caagcatacc tgctgcagtt 1380  
 cgcgaggcca gaggtttaac tgaagatctt gtacgaatat ctgtgggaat tgaggatgtg 1440  
 aatgatctca ttgctgatct tggcaatgca cttagaactg gacctcttta atgtcttctc 1500  
 cccccccca ccaaaaaaga aaaaaattca tccttaagaa gttggattag catgttgagg 1560  
 atttgggagc attgctatcc tgtctttgga ttcttgagag tggaaacttg aagtgttgct 1620  
 tatgtgcatg taataaaatc aatatttctt gtaattttgt tgtaacaatt gttatcctta 1680  
 ccttgcaata tcatgtcata caagttacta ttgaaaaaaa aaaaaaaaaa aaa 1733

<210> 38  
 <211> 467  
 <212> PRT  
 <213> Glycine max

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<400> 38
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Ile Asp Arg Tyr Ala Gln Ser Thr Thr Ala Ala Thr Arg Trp Glu Cys
20      25      30

Leu Gly Phe Asn Lys Ser Glu Asn Phe Ser Thr Lys Arg Val Leu Arg
35      40      45

Ala Glu Gly Phe Lys Leu Asn Cys Leu Val Glu Asn Arg Glu Met Glu
50      55      60

Val Glu Ser Ser Ser Ser Ser Leu Val Asp Asp Ala Ala Met Ser Leu
65      70      75      80

Ser Glu Glu Asp Leu Gly Glu Pro Ser Ile Ser Thr Met Val Met Asn
85      90      95

Phe Glu Ser Lys Phe Asp Pro Phe Gly Ala Ile Ser Thr Pro Leu Tyr
100     105     110

Gln Thr Ala Thr Phe Lys Gln Pro Ser Ala Ile Glu Asn Gly Pro Tyr
115     120     125

Asp Tyr Thr Arg Ser Gly Asn Pro Thr Arg Asp Ala Leu Glu Ser Leu
130     135     140

Leu Ala Lys Leu Asp Lys Ala Asp Arg Ala Leu Cys Phe Thr Ser Gly
145     150     155     160

Met Ala Ala Leu Ser Ala Val Val Arg Leu Val Gly Thr Gly Glu Glu
165     170     175

Ile Val Thr Gly Asp Asp Val Tyr Gly Gly Ser Asp Arg Leu Leu Ser
180     185     190

Gln Val Val Pro Arg Thr Gly Ile Val Val Lys Arg Val Asn Thr Cys
195     200     205

Asp Leu Asp Glu Val Ala Ala Ala Ile Gly Leu Arg Thr Lys Leu Val
210     215     220

Trp Leu Glu Ser Pro Thr Asn Pro Arg Leu Gln Ile Ser Asp Ile Arg
225     230     235     240

Lys Ile Ser Glu Met Ala His Ser His Gly Ala Leu Val Leu Val Asp
245     250     255

Asn Ser Ile Met Ser Pro Val Leu Ser Gln Pro Leu Glu Leu Gly Ala
260     265     270

Asp Ile Val Met His Ser Ala Thr Lys Phe Ile Ala Gly His Ser Asp
275     280     285

Ile Met Ala Gly Val Leu Ala Val Lys Gly Glu Lys Leu Gly Lys Glu
290     295     300

Met Tyr Phe Leu Gln Asn Ala Glu Gly Ser Gly Leu Ala Pro Phe Asp
305     310     315     320

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[illegible][illegible]

$\frac{1}{\sqrt{\pi}} \int_{-\infty}^{\infty} f(x) e^{-x^2} dx = \frac{1}{\sqrt{\pi}} \int_{-\infty}^{\infty} f(x) e^{-x^2} dx$

[illegible][illegible]

**THE** **W** **E** **S** **T** **R** **N** **A** **L** **I** **N** **D** **E** **X** **P** **O** **S** **I** **T** **I** **O** **N**

[illegible]

$\frac{1}{\sqrt{\pi}} \int_{-\infty}^{\infty} f(x) e^{-x^2} dx = \frac{1}{\sqrt{\pi}} \int_{-\infty}^{\infty} f(x) e^{-x^2} dx$

[illegible][illegible][illegible][illegible]

<220>  
 <221> UNSURE  
 <222> (99)

<400> 40

Ser Val Ala Thr Ile Leu Thr Ser Phe Glu Asn Ser Phe Asp Lys Tyr  
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Gly Ala Leu Ser Thr Pro Leu Tyr Gln Thr Ala Thr Phe Lys Gln Pro  
 20 25 30

Ser Ala Thr Val Asn Gly Ala Tyr Asp Tyr Thr Arg Ser Gly Asn Pro  
 35 40 45

Thr Arg Asp Val Leu Gln Ser Leu Met Ala Lys Leu Glu Lys Ala Asp  
 50 55 60

Gln Ala Phe Cys Phe Thr Ser Gly Met Ala Ser Leu Xaa Ala Val Thr  
 65 70 75 80

His Leu Leu Gln Ala Gly Gln Glu Ile Val Ala Gly Glu Asp Ile Tyr  
 85 90 95

Gly Gly Xaa Asp Arg Leu Leu Ser Gln Val Val Pro Arg Asn Gly Ile  
 100 105 110

Val Val Lys Arg Val Asp Thr Thr Lys Ile Asn Asp Val Thr Ala Ala  
 115 120 125

Ser Asp Pro  
 130

<210> 41  
 <211> 464  
 <212> PRT  
 <213> Arabidopsis thaliana

<400> 41

Met Thr Ser Ser Leu Ser Leu His Ser Ser Phe Val Pro Ser Phe Ala  
 1 5 10 15

Asp Leu Ser Asp Arg Gly Leu Ile Ser Lys Asn Ser Pro Thr Ser Val  
 20 25 30

Ser Ile Ser Lys Val Pro Thr Trp Glu Lys Lys Gln Ile Ser Asn Arg  
 35 40 45

Asn Ser Phe Lys Leu Asn Cys Val Met Glu Lys Ser Val Asp Gly Gln  
 50 55 60

Thr His Ser Thr Val Asn Asn Thr Thr Asp Ser Leu Asn Thr Met Asn  
 65 70 75 80

Ile Lys Glu Glu Ala Ser Val Ser Thr Leu Leu Val Asn Leu Asp Asn  
 85 90 95

Lys Phe Asp Pro Phe Asp Ala Met Ser Thr Pro Leu Tyr Gln Thr Ala  
 100 105 110



Thr	Phe	Lys	Gln	Pro	Ser	Ala	Ile	Glu	Asn	Gly	Pro	Tyr	Asp	Tyr	Thr
		115					120					125			
Arg	Ser	Gly	Asn	Pro	Thr	Arg	Asp	Ala	Leu	Glu	Ser	Leu	Leu	Ala	Lys
	130					135					140				
Leu	Asp	Lys	Ala	Asp	Arg	Ala	Phe	Cys	Phe	Thr	Ser	Gly	Met	Ala	Ala
145					150					155					160
Leu	Ser	Ala	Val	Thr	His	Leu	Ile	Lys	Asn	Gly	Glu	Glu	Ile	Val	Ala
				165					170					175	
Gly	Asp	Asp	Val	Tyr	Gly	Gly	Ser	Asp	Arg	Leu	Leu	Ser	Gln	Val	Val
			180					185					190		
Pro	Arg	Ser	Gly	Val	Val	Val	Lys	Arg	Val	Asn	Thr	Thr	Lys	Leu	Asp
		195					200					205			
Glu	Val	Ala	Ala	Ala	Ile	Gly	Pro	Gln	Thr	Lys	Leu	Val	Trp	Leu	Glu
	210					215					220				
Ser	Pro	Thr	Asn	Pro	Arg	Gln	Gln	Ile	Ser	Asp	Ile	Arg	Lys	Ile	Ser
225					230					235					240
Glu	Met	Ala	His	Ala	Gln	Gly	Ala	Leu	Val	Leu	Val	Asp	Asn	Ser	Ile
				245					250					255	
Met	Ser	Pro	Val	Leu	Ser	Arg	Pro	Leu	Glu	Leu	Gly	Ala	Asp	Ile	Val
			260					265					270		
Met	His	Ser	Ala	Thr	Lys	Phe	Ile	Ala	Gly	His	Ser	Asp	Val	Met	Ala
		275					280					285			
Gly	Val	Leu	Ala	Val	Lys	Gly	Glu	Lys	Leu	Ala	Lys	Glu	Val	Tyr	Phe
	290					295					300				
Leu	Gln	Asn	Ser	Glu	Gly	Ser	Gly	Leu	Ala	Pro	Phe	Asp	Cys	Trp	Leu
305					310					315					320
Cys	Leu	Arg	Gly	Ile	Lys	Thr	Met	Ala	Leu	Arg	Ile	Glu	Lys	Gln	Gln
				325					330					335	
Glu	Asn	Ala	Arg	Lys	Ile	Ala	Met	Tyr	Leu	Ser	Ser	His	Pro	Arg	Val
			340					345					350		
Lys	Lys	Val	Tyr	Tyr	Ala	Gly	Leu	Pro	Asp	His	Pro	Gly	His	His	Leu
		355					360					365			
His	Phe	Ser	Gln	Ala	Lys	Gly	Ala	Gly	Ser	Val	Phe	Ser	Phe	Ile	Thr
	370					375					380				
Gly	Ser	Val	Ala	Leu	Ser	Lys	His	Leu	Val	Glu	Thr	Thr	Lys	Tyr	Phe
385					390					395					400
Ser	Ile	Ala	Val	Ser	Phe	Gly	Ser	Val	Lys	Ser	Leu	Ile	Ser	Met	Pro
				405					410					415	
Cys	Phe	Met	Ser	His	Ala	Ser	Ile	Pro	Ala	Glu	Val	Arg	Glu	Ala	Arg
			420					425					430		

Gly Leu Thr Glu Asp Leu Val Arg Ile Ser Ala Gly Ile Glu Asp Val  
 435 440 445

Asp Asp Leu Ile Ser Asp Leu Asp Ile Ala Phe Lys Thr Phe Pro Leu  
 450 455 460

<210> 42

<211> 1113

<212> DNA

<213> Zea mays

<400> 42

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 gccggcggga gcgtcagccg gaagtatggg cccgcggccg tcgccagcgg cgccgtagtt 120  
 gtcgacaaca gctccgcgtt ccggatggag cccgaggtgc cgctcgtcat ccccgaggtc 180  
 aaccccgagg ccatggcgaa cgtccgcctc gggcaggggg cgattgtggc aaatccgaat 240  
 tgctcgacca tcatctgcct catggctgcc acgcccgtcc atcgccacgc taaggtgtta 300  
 aggatggttg tcagcacata ccaagcagca agtgggtgcg gtgctgcggc aatggaagaa 360  
 ctcaagctgc agactcagga ggtcttgaa gggaaaggcg caacatgcaa cattttcaaa 420  
 cagcagtatg cttttaatat attctcacac aatgcaccag ttcttgagaa tgggtataac 480  
 gaggaggaaa tgaaaatggt gaaggagacc aggaaaattt ggaatgacaa ggaggtgaaa 540  
 gtaactgcga cttgcatacg ggttcctgtg atgcgcgcac atgctgaaag tgtcaatcta 600  
 cagtttgaaa agccacttga tgaggatact gcaagagaaa ttttgagagc agctcctggt 660  
 gttaccatta ttgatgaccg agcttccaat cgctttccta cacctctgga ggtatcagac 720  
 aaagatgacg tagcagtggg taggattcgt caggacttgt ccctggatgg taaccgaggg 780  
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 attgctgaaa tgctgctgaa gtgaatgtga cctaaccctc ttgtccctcc ctccctgtcc 900  
 ctaattgctc tgatcaaatt ctggactgta ctctgattag tttgtcctca attttggtcg 960  
 cctgttctgt attctgccgt gctagtgcaa taattgtgtt atgggcttga gttatctgct 1020  
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<210> 43

<211> 287

<212> PRT

<213> Zea mays

<400> 43

Ala Val Gln Asp Leu Ala Ala Pro Gly Ala Phe Asp Gly Val Asp Ile  
 1 5 10 15  
 Ala Leu Phe Ser Ala Gly Gly Ser Val Ser Arg Lys Tyr Gly Pro Ala  
 20 25 30  
 Ala Val Ala Ser Gly Ala Val Val Val Asp Asn Ser Ser Ala Phe Arg  
 35 40 45  
 Met Glu Pro Glu Val Pro Leu Val Ile Pro Glu Val Asn Pro Glu Ala  
 50 55 60  
 Met Ala Asn Val Arg Leu Gly Gln Gly Ala Ile Val Ala Asn Pro Asn  
 65 70 75 80  
 Cys Ser Thr Ile Ile Cys Leu Met Ala Ala Thr Pro Leu His Arg His  
 85 90 95  
 Ala Lys Val Leu Arg Met Val Val Ser Thr Tyr Gln Ala Ala Ser Gly  
 100 105 110

Ala Gly Ala Ala Ala Met Glu Glu Leu Lys Leu Gln Thr Gln Glu Val  
115 120 125

Leu Glu Gly Lys Ala Pro Thr Cys Asn Ile Phe Lys Gln Gln Tyr Ala  
130 135 140

Phe Asn Ile Phe Ser His Asn Ala Pro Val Leu Glu Asn Gly Tyr Asn  
145 150 155 160

Glu Glu Glu Met Lys Met Val Lys Glu Thr Arg Lys Ile Trp Asn Asp  
165 170 175

Lys Glu Val Lys Val Thr Ala Thr Cys Ile Arg Val Pro Val Met Arg  
180 185 190

Ala His Ala Glu Ser Val Asn Leu Gln Phe Glu Lys Pro Leu Asp Glu  
195 200 205

Asp Thr Ala Arg Glu Ile Leu Arg Ala Ala Pro Gly Val Thr Ile Ile  
210 215 220

Asp Asp Arg Ala Ser Asn Arg Phe Pro Thr Pro Leu Glu Val Ser Asp  
225 230 235 240

Lys Asp Asp Val Ala Val Gly Arg Ile Arg Gln Asp Leu Ser Leu Asp  
245 250 255

Gly Asn Arg Gly Leu Asp Ile Phe Val Cys Gly Asp Gln Ile Arg Lys  
260 265 270

Gly Ala Ala Leu Asn Ala Val Gln Ile Ala Glu Met Leu Leu Lys  
275 280 285

<210> 44  
<211> 1402  
<212> DNA  
<213> Oryza sativa

<400> 44

gcccaactcc	caaaacccta	gaaccgcgcc	gccacaatgc	aggccgcgcg	cgccgcgcgtc	60
caccgcccgc	acctcctcgg	cgcctacccc	ggcgggtggc	gcgcgcgcgcg	cccgtcgtcc	120
accgtgcgga	tggcgcttcg	ggaggacggg	ccgtcgggtg	cgatcgtggg	cgcgacgggc	180
gccgtcggcc	aggagtctct	ccgcgtcatc	tcctcccggg	gcttccccta	ccggagcctc	240
cgctcctcgc	ccagcgagcg	ctccgcgggg	aagcgctctc	cgttcgaggg	ccaggagtag	300
accgtccagg	acctcgccgc	gccggggcgc	ttcgacgggg	tggacatcgc	gctcttcagc	360
gccggcgggc	gggtcagccg	cgcccacgct	cccgcggccg	tcgccagcgc	cgccgtcgtc	420
gtggacaaca	gctccgcctt	ccggatggac	cccgaagggt	cgctcgtcat	ccccgaggtc	480
aatcccagg	ccatggcgca	cgctccggctg	ggaaaggggg	ctattgtggc	caaccggaac	540
tgttccacca	tcattctgcct	catgggtgcc	acacctctgc	accgccacgc	caagggtggt	600
aggatggttg	tcagcactta	ccaagcagca	agtgggtgctg	gggctgcggc	catggaagaa	660
ctcaaacttc	aaactcaaga	ggtcttggtg	gggaaagcac	caacatgcaa	cattttcagt	720
cagcagtatg	cttttaatat	attttcacat	aatgcaccaa	ttgttgaaaa	tgggtacaat	780
gaggaggaga	tgaagatggt	gaaggagacc	agaaaaatct	ggaatgataa	agatgtgaag	840
gtaactgcaa	cctgcatacg	agttcctgtg	atgcgtgcac	atgctgaaag	tgtgaatcta	900
cagtttgaaa	agccacttga	tgaggatact	gcaagggaag	tcttgagggc	agctgaaggt	960
gttaccatta	ttgatgaccg	tgcttccaat	cgcttcccca	cacctcttga	ggtatcggat	1020
aaagatgatg	tagcagtggg	tagaattcgt	caggatttgt	cgcaagatga	taacaaaggg	1080
ctggacatat	ttgtttgtgg	agatcaaata	cgtaaagggtg	ctgcactcaa	tgctgtgcag	1140
attgctgaaa	tgctactcaa	gtgattttct	tttctgtacc	tttctctcct	tgccctctct	1200
tgctctagtc	attgttttgac	ggatgtactc	tggttagtat	gagatcaatt	ttgatcatct	1260

tttgtaatct atattcctag tgaaataaat gtaaaacggt tttgctctat cttctgcaca 1320  
 agtgtagaag aaatctgaaa ttgggaaatt ggagtgtggc ccttgttcaa aaaaaaaaaa 1380  
 aaaaaaaaaa aaaaaaaaaa aa 1402

<210> 45  
 <211> 375  
 <212> PRT  
 <213> Oryza sativa

<400> 45  
 Met Gln Ala Ala Ala Ala Val His Arg Pro His Leu Leu Gly Ala  
 1 5 10 15  
 Tyr Pro Gly Gly Gly Arg Ala Arg Arg Pro Ser Ser Thr Val Arg Met  
 20 25 30  
 Ala Leu Arg Glu Asp Gly Pro Ser Val Ala Ile Val Gly Ala Thr Gly  
 35 40 45  
 Ala Val Gly Gln Glu Phe Leu Arg Val Ile Ser Ser Arg Gly Phe Pro  
 50 55 60  
 Tyr Arg Ser Leu Arg Leu Leu Ala Ser Glu Arg Ser Ala Gly Lys Arg  
 65 70 75 80  
 Leu Pro Phe Glu Gly Gln Glu Tyr Thr Val Gln Asp Leu Ala Ala Pro  
 85 90 95  
 Gly Ala Phe Asp Gly Val Asp Ile Ala Leu Phe Ser Ala Gly Gly Gly  
 100 105 110  
 Val Ser Arg Ala His Ala Pro Ala Ala Val Ala Ser Gly Ala Val Val  
 115 120 125  
 Val Asp Asn Ser Ser Ala Phe Arg Met Asp Pro Glu Val Pro Leu Val  
 130 135 140  
 Ile Pro Glu Val Asn Pro Glu Ala Met Ala His Val Arg Leu Gly Lys  
 145 150 155 160  
 Gly Ala Ile Val Ala Asn Pro Asn Cys Ser Thr Ile Ile Cys Leu Met  
 165 170 175  
 Ala Ala Thr Pro Leu His Arg His Ala Lys Val Val Arg Met Val Val  
 180 185 190  
 Ser Thr Tyr Gln Ala Ala Ser Gly Ala Gly Ala Ala Ala Met Glu Glu  
 195 200 205  
 Leu Lys Leu Gln Thr Gln Glu Val Leu Ala Gly Lys Ala Pro Thr Cys  
 210 215 220  
 Asn Ile Phe Ser Gln Gln Tyr Ala Phe Asn Ile Phe Ser His Asn Ala  
 225 230 235 240  
 Pro Ile Val Glu Asn Gly Tyr Asn Glu Glu Glu Met Lys Met Val Lys  
 245 250 255  
 Glu Thr Arg Lys Ile Trp Asn Asp Lys Asp Val Lys Val Thr Ala Thr  
 260 265 270

Cys Ile Arg Val Pro Val Met Arg Ala His Ala Glu Ser Val Asn Leu  
 275 280 285  
 Gln Phe Glu Lys Pro Leu Asp Glu Asp Thr Ala Arg Glu Ile Leu Arg  
 290 295 300  
 Ala Ala Glu Gly Val Thr Ile Ile Asp Asp Arg Ala Ser Asn Arg Phe  
 305 310 315 320  
 Pro Thr Pro Leu Glu Val Ser Asp Lys Asp Asp Val Ala Val Gly Arg  
 325 330 335  
 Ile Arg Gln Asp Leu Ser Gln Asp Asp Asn Lys Gly Leu Asp Ile Phe  
 340 345 350  
 Val Cys Gly Asp Gln Ile Arg Lys Gly Ala Ala Leu Asn Ala Val Gln  
 355 360 365  
 Ile Ala Glu Met Leu Leu Lys  
 370 375

<210> 46  
 <211> 1391  
 <212> DNA  
 <213> Glycine max

<400> 46  
 gcacgagctt cactctctgt tttgcgccac aaccacctct tctcggggccc cctcccgggcc 60  
 cgccccaaagc ccacctcctc ctccctcctcc aggatccgaa tgtccctccg cgagaacggc 120  
 ccctccatcg ccgtcgtggg cgtcaccggc gccgtcggcc aggagtccct ctccgtcctc 180  
 tccgaccgcg acttccccta ccgtctccatt catatgctgg cttccaagcg ctccgctggc 240  
 cgccgcatca ctttcgagga cagggactac gtctgcccagg agctcacgcc ggagagcttc 300  
 gacggtgtcg acatcgcgct cttcagcgcc ggcgggtcca tcagcaagca cttcggcccc 360  
 atcgccgctca atcgtggaac ggtcgtggtc gacaacagct ccgcgtttcg gatgaacgag 420  
 aaggtgcctt tggtaattcc cgaagtgaac cccgaagcaa tgcaaaacat caaagccgga 480  
 acgggaaagg gcgcactcat tgctaaccct aattgctcca ccattatatg cttgatggct 540  
 gctacccctc ttcacgacg tgccaagggtg ttacgtatgg ttgttagtac ctatcaggct 600  
 gcgagtgggtg ctggtgctgc tgcaatggaa gagcttgagc tgcaaaactcg tgaggtgttg 660  
 gaaggaaaac caccacttg taaaatattt aaccgacagt atgcttttaa tctattctca 720  
 cataatgcgt ctgttctttc aaatggatat aatgaagaag aaatgaaaat ggtcaaggag 780  
 accaggaaaa tctggaatga caaggatgtt aaagtaactg ccacatgcat acgagttccc 840  
 atcatgcgag ctcatgctga gagtgtgaat cttcaatttg aaagaccctc tgatgaggac 900  
 actgcaagag atattctgaa aaatgctcca ggtgtagtgg ttattgatga tcgtgaatcc 960  
 aatcattttc ctactccact ggaagtgtca aacaaggatg atgttgctgt tggtaggatt 1020  
 cggcaggacc tgtctcagga tgggaatcaa gggttggaca tctttgtatg tggggatcaa 1080  
 attcgcaagg gagctgcact taacgcaatc cagattgctg agatgttgct atgagttctg 1140  
 gtttttcaag gatctggtac ttaaagatta tgcttctttt gaaacagttt tgtatgtgct 1200  
 agttgtatgt ggttattcat ttcttttgtg atgtttaact agtccaagta tcttttcaac 1260  
 gatgtggtag cacactagct ggaaacagtt tttttaaggt cttggtgcgt aatatctgca 1320  
 atccttttca ccgggaataa caagcactgg ttatggcaaa aaaaaaaaaa aaaaaaaaaa 1380  
 aaaaaaaaaa a 1391

<210> 47  
 <211> 377  
 <212> PRT  
 <213> Glycine max

<400> 47  
Ala Arg Ala Ser Leu Ser Val Leu Arg His Asn His Leu Phe Ser Gly  
1 5 10 15  
Pro Leu Pro Ala Arg Pro Lys Pro Thr Ser Ser Ser Ser Ser Arg Ile  
20 25 30  
Arg Met Ser Leu Arg Glu Asn Gly Pro Ser Ile Ala Val Val Gly Val  
35 40 45  
Thr Gly Ala Val Gly Gln Glu Phe Leu Ser Val Leu Ser Asp Arg Asp  
50 55 60  
Phe Pro Tyr Arg Ser Ile His Met Leu Ala Ser Lys Arg Ser Ala Gly  
65 70 75 80  
Arg Arg Ile Thr Phe Glu Asp Arg Asp Tyr Val Val Gln Glu Leu Thr  
85 90 95  
Pro Glu Ser Phe Asp Gly Val Asp Ile Ala Leu Phe Ser Ala Gly Gly  
100 105 110  
Ser Ile Ser Lys His Phe Gly Pro Ile Ala Val Asn Arg Gly Thr Val  
115 120 125  
Val Val Asp Asn Ser Ser Ala Phe Arg Met Asn Glu Lys Val Pro Leu  
130 135 140  
Val Ile Pro Glu Val Asn Pro Glu Ala Met Gln Asn Ile Lys Ala Gly  
145 150 155 160  
Thr Gly Lys Gly Ala Leu Ile Ala Asn Pro Asn Cys Ser Thr Ile Ile  
165 170 175  
Cys Leu Met Ala Ala Thr Pro Leu His Arg Arg Ala Lys Val Leu Arg  
180 185 190  
Met Val Val Ser Thr Tyr Gln Ala Ala Ser Gly Ala Gly Ala Ala Ala  
195 200 205  
Met Glu Glu Leu Glu Leu Gln Thr Arg Glu Val Leu Glu Gly Lys Pro  
210 215 220  
Pro Thr Cys Lys Ile Phe Asn Arg Gln Tyr Ala Phe Asn Leu Phe Ser  
225 230 235 240  
His Asn Ala Ser Val Leu Ser Asn Gly Tyr Asn Glu Glu Glu Met Lys  
245 250 255  
Met Val Lys Glu Thr Arg Lys Ile Trp Asn Asp Lys Asp Val Lys Val  
260 265 270  
Thr Ala Thr Cys Ile Arg Val Pro Ile Met Arg Ala His Ala Glu Ser  
275 280 285  
Val Asn Leu Gln Phe Glu Arg Pro Leu Asp Glu Asp Thr Ala Arg Asp  
290 295 300  
Ile Leu Lys Asn Ala Pro Gly Val Val Val Ile Asp Asp Arg Glu Ser  
305 310 315 320

Asn His Phe Pro Thr Pro Leu Glu Val Ser Asn Lys Asp Asp Val Ala  
325 330 335

Val Gly Arg Ile Arg Gln Asp Leu Ser Gln Asp Gly Asn Gln Gly Leu  
340 345 350

Asp Ile Phe Val Cys Gly Asp Gln Ile Arg Lys Gly Ala Ala Leu Asn  
355 360 365

Ala Ile Gln Ile Ala Glu Met Leu Leu  
370 375

<210> 48  
<211> 1470  
<212> DNA  
<213> Glycine max

<400> 48  
gcacgaggtc tgttttaaaa tccaacactt aatctctctc ttccgagcct aaaatcccaa 60  
tggtttcact ctctgttttg cgccacaacc acctcttctc gggccccctc ccggcccgcg 120  
ccaagcccac ctctctctcc tcttccagga tccgaatgtc cctccgcgag aacggcccct 180  
ccatcgccgt cgtgggcgtc accggcgccg tcggccagga gttcctctcc gtcctctccg 240  
accgcgactt cccctaccgc tccattcata tgctggcttc caagcgctcc gctggccgcc 300  
gcatcacctt cgaggacagg gactacgtcg tccaggagct cagcgcggag agcttcgacg 360  
gtgtcgacat cgcgctcttc agcgccggcg gctccatcag caagcacttc ggccccatcg 420  
ccgtcaatcg tggaacgggtc gtgggtcgaca acagctccgc gtttcggatg gacgagaagg 480  
tgcttttggg aattcccga aatgaacccc aagcaatgca aaacatcaaa gccggaacgg 540  
gaaagggcgc actcattgct aaccctaatt gctccaccat tagatgcttg aaggctgcta 600  
cccctcttca tcgacgtgcc aagggtgttac gtatgggttg tagtacctat caggctgcga 660  
gtgggtgctgg tgctgctgca atggaagagc ttgagctgca aactcgtgag gtgttggaag 720  
gaaaaccacc cacttgtaaa atattttaacc gacagtatgc ttttaatcta ttctcacata 780  
atgcgtctgt tctttcaaat ggatataatg aagaagaaat gaaaatgggtc aaggagacca 840  
ggaaaatctg gaatgacaag gatgttaaag taactgccac atgcatacga gttcccatca 900  
tgcgagctca tgctgagagt gtgaatcttc aatttgaaag accccttgat gaggacactg 960  
caagagatat tctgaaaaat gctccagggt tagtggttat tgatgatcgt gaatccaatc 1020  
atttttctac tccactggaa gtgtcaaaca aggatgatgt tgctgttggt aggattcggc 1080  
aggacctgtc tcaggatggg aatcaagggt tggacatctt tgtatgtggg gatcaaattc 1140  
gcaagggagc tgcacttaac gcaatccaga ttgctgagat gttgctatga gttctgggtt 1200  
ttcaaggatc tggtaactaa agattatgct tcttttgaaa cagttttgta tgtgctagtt 1260  
gtatgtgggt attcatttct tttgtgatgt ttaactagtc caagtatctt ttcaacgatg 1320  
tggtagcaca ctagctggaa acagtttttt taaggctctg gtgcgtaata tctgcaatcc 1380  
ttttcaccgg gaataacaag cactggtttt ggcaaaaaaa aaaaaaaa 1440  
aaaaaaaaa aaaaaaaaaa aaaaaaaaaa . 1470

<210> 49  
<211> 376  
<212> PRT  
<213> Glycine max

<400> 49  
Met Ala Ser Leu Ser Val Leu Arg His Asn His Leu Phe Ser Gly Pro  
1 5 10 15  
Leu Pro Ala Arg Pro Lys Pro Thr Ser Ser Ser Ser Ser Arg Ile Arg  
20 25 30  
Met Ser Leu Arg Glu Asn Gly Pro Ser Ile Ala Val Val Gly Val Thr  
35 40 45





Ile Gln Ile Ala Glu Met Leu Leu  
370 375

<210> 50  
<211> 1609  
<212> DNA  
<213> Triticum aestivum

<400> 50  
caccaccacc cacctaccca aatcccagcc gccctaaaac cctaggccgc caaaccgcgc 60  
gccgccgcgc ccgcaatgca ggccgcgcgc gccgtccacc ggccacacct cctcgcggcg 120  
tccccgctcg ggggccgcgc cagccgcgcg ccctccacgg tccgcatggc gctccgcgag 180  
gacgggccct ccgtggccat cgtgggcgcg accggcgcgg tggggcagga gttcctccgc 240  
gtcatcaccg cccgcgactt cccctaccgc agcctgcgcg tcctcgccag cgagcgctcc 300  
gcgggcaagc gcatcgactt cgagggccgc gactacaccg tccaggacct cgcggcgcgc 360  
ggggccttcg acgggggtcg catcgcgctc ttcagcgccg gcgggagcat cagccgcgcg 420  
cacgcgcccg ccgccgtcgc cagcggcgcc gtcgtcgtgg ataacagctc cgcctaccgg 480  
atggaccccg acgtgccgct cgtcatcccg gaggttaacc ccgaggccat ggccgacgtc 540  
cggctcggga aaggggctat tgtggccaac cccaactgtt ccaccatcat ctgcctcatg 600  
gctgtcacgc cgctgcatcg ccacgccaaag gtgaaaagga tggttgtcag cacataccaa 660  
gcagcaagtg gtgctgggtg tgcagccatg gaagaactca aacttcagac tcgagaggtc 720  
ttggaaggaa agccaccaac ctgtaacatt ttcagtcaac agtatgcttt taatatattt 780  
tcgcataatg cacctattgt tgaaaatggc tataatgagg aagagatgaa aatgggtgaag 840  
gagaccagaa aaatctggaa tgacaaggat gtaagagtaa ctgcaacttg tatacggggtt 900  
cctacgatgc gcgcgcatgc cgaaagcgtg aatctacagt ttgaaaagcc acttgatgag 960  
gacactgcca gagaaatctt gagggcagct cctgggtgta ccattagtga cgaccgtgct 1020  
gccaaccgct tccctacacc actggaggta tcggataaag atgacgtatc agttggtagg 1080  
attcgccagg acttgtcaca agatgataac agagggttgg agttatttgt ctgtggagac 1140  
cagatacgta aaggcgccgc gctgaacgct gtgcagattg ctgaaatgct actgaagtga 1200  
ccgccttttt accattgtct catgtgccac gttgctctat ccattgatgg attgatgtac 1260  
tctagtcact ttcaaccagc ttttggtcgt cgtctttttt gtaatctgtc aacctagcag 1320  
aagaagtgtg agacgggctt tagtcatctg ttgcacacaa aagtgcagcc acaagttag 1380  
aaaaggaggg ttttcacttg ttcggatttt gccttagggt ggactttgtt gcaagttagt 1440  
cgtttgtttc ttgaaagctg gtctgctgta actttacccc caaagccctc gagataacga 1500  
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<211> 374  
<212> PRT  
<213> Triticum aestivum

<400> 51  
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35 40 45  
Val Gly Gln Glu Phe Leu Arg Val Ile Thr Ala Arg Asp Phe Pro Tyr  
50 55 60  
Arg Ser Leu Arg Leu Leu Ala Ser Glu Arg Ser Ala Gly Lys Arg Ile  
65 70 75 80  
Asp Phe Glu Gly Arg Asp Tyr Thr Val Gln Asp Leu Ala Ala Pro Gly  
85 90 95

Ala Phe Asp Gly Val Asp Ile Ala Leu Phe Ser Ala Gly Gly Ser Ile  
 100 105 110  
 Ser Arg Ala His Ala Pro Ala Ala Val Ala Ser Gly Ala Val Val Val  
 115 120 125  
 Asp Asn Ser Ser Ala Tyr Arg Met Asp Pro Asp Val Pro Leu Val Ile  
 130 135 140  
 Pro Glu Val Asn Pro Glu Ala Met Ala Asp Val Arg Leu Gly Lys Gly  
 145 150 155 160  
 Ala Ile Val Ala Asn Pro Asn Cys Ser Thr Ile Ile Cys Leu Met Ala  
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 Val Thr Pro Leu His Arg His Ala Lys Val Lys Arg Met Val Val Ser  
 180 185 190  
 Thr Tyr Gln Ala Ala Ser Gly Ala Gly Ala Ala Ala Met Glu Glu Leu  
 195 200 205  
 Lys Leu Gln Thr Arg Glu Val Leu Glu Gly Lys Pro Pro Thr Cys Asn  
 210 215 220  
 Ile Phe Ser Gln Gln Tyr Ala Phe Asn Ile Phe Ser His Asn Ala Pro  
 225 230 235 240  
 Ile Val Glu Asn Gly Tyr Asn Glu Glu Glu Met Lys Met Val Lys Glu  
 245 250 255  
 Thr Arg Lys Ile Trp Asn Asp Lys Asp Val Arg Val Thr Ala Thr Cys  
 260 265 270  
 Ile Arg Val Pro Thr Met Arg Ala His Ala Glu Ser Val Asn Leu Gln  
 275 280 285  
 Phe Glu Lys Pro Leu Asp Glu Asp Thr Ala Arg Glu Ile Leu Arg Ala  
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 Ala Pro Gly Val Thr Ile Ser Asp Asp Arg Ala Ala Asn Arg Phe Pro  
 305 310 315 320  
 Thr Pro Leu Glu Val Ser Asp Lys Asp Asp Val Ser Val Gly Arg Ile  
 325 330 335  
 Arg Gln Asp Leu Ser Gln Asp Asp Asn Arg Gly Leu Glu Leu Phe Val  
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 Ala Glu Met Leu Leu Lys  
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<210> 52  
 <211> 340  
 <212> PRT  
 <213> Aquifex aeolicus

<400> 52  
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Val Leu Tyr Ala Ser Glu Arg Ser Glu Gly Lys Val Leu Thr Phe Lys  
35 40 45  
Gly Lys Glu Tyr Thr Val Lys Ala Leu Asn Lys Glu Asn Ser Phe Lys  
50 55 60  
Gly Ile Asp Ile Ala Leu Phe Ser Ala Gly Gly Ser Thr Ser Lys Glu  
65 70 75 80  
Trp Ala Pro Lys Phe Ala Lys Asp Gly Val Val Val Ile Asp Asn Ser  
85 90 95  
Ser Ala Trp Arg Met Asp Pro Asp Val Pro Leu Val Val Pro Glu Val  
100 105 110  
Asn Pro Glu Asp Val Lys Asp Phe Lys Lys Lys Gly Ile Ile Ala Asn  
115 120 125  
Pro Asn Cys Ser Thr Ile Gln Met Val Val Ala Leu Lys Pro Ile Tyr  
130 135 140  
Asp Lys Ala Gly Ile Lys Arg Val Val Val Ser Thr Tyr Gln Ala Val  
145 150 155 160  
Ser Gly Ala Gly Ala Lys Ala Ile Glu Asp Leu Lys Asn Gln Thr Lys  
165 170 175  
Ala Trp Cys Glu Gly Lys Glu Met Pro Lys Ala Gln Lys Phe Pro His  
180 185 190  
Gln Ile Ala Phe Asn Ala Leu Pro His Ile Asp Val Phe Phe Glu Asp  
195 200 205  
Gly Tyr Thr Lys Glu Glu Asn Lys Met Leu Tyr Glu Thr Arg Lys Ile  
210 215 220  
Met His Asp Glu Asn Ile Lys Val Ser Ala Thr Cys Val Arg Ile Pro  
225 230 235 240  
Val Phe Tyr Gly His Ser Glu Ser Ile Ser Met Glu Thr Glu Lys Glu  
245 250 255  
Ile Ser Pro Glu Glu Ala Arg Glu Val Leu Lys Asn Ala Pro Gly Val  
260 265 270  
Ile Val Ile Asp Asn Pro Gln Asn Asn Glu Tyr Pro Met Pro Ile Met  
275 280 285  
Ala Glu Gly Arg Asp Glu Val Phe Val Gly Arg Ile Arg Lys Asp Arg  
290 295 300  
Val Phe Glu Pro Gly Leu Ser Met Trp Val Val Ala Asp Asn Ile Arg  
305 310 315 320

Lys Gly Ala Ala Thr Asn Ala Val Gln Ile Ala Glu Leu Leu Val Lys  
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Glu Gly Leu Ile  
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<210> 53  
 <211> 1727  
 <212> DNA  
 <213> Glycine max

<400> 53  
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 caccattatg atcaactaca ttgaccaa atccgagatcag ggttttgaag ttgattactt 960  
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 <212> PRT  
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 Thr Tyr Ser His Ser Leu Asn Gln Asn Ala Leu Ser Gln Lys Leu Phe  
 35 40 45  
 Phe Leu Pro Leu Lys Phe Lys Ala Thr Thr Lys Pro Arg Ala Leu Arg  
 50 55 60





Val Arg Glu Leu Val Leu Ser Arg Asp Leu Thr Leu Ile Ile Glu Pro  
 35 40 45  
 Gly Arg Ser Leu Ile Ala Asn Thr Cys Cys Phe Val Asn Lys Val Thr  
 50 55 60  
 Gly Val Lys Ser Asn Gly Thr Lys Asn Phe Ile Val Val Asp Gly Ser  
 65 70 75 80  
 Met Ala Glu Leu Ile Arg Pro Ser Leu Tyr Gly Ala Tyr Gln His Ile  
 85 90 95  
 Glu Leu Val Ser Pro Ser Pro Gly Ala Glu Val Ala Thr Phe Asp Ile  
 100 105 110  
 Val Gly Pro Val Cys Glu Ser Ala Asp Phe Leu Gly Lys Asp Arg Glu  
 115 120 125  
 Leu Pro Thr Pro Asp Lys Gly Ala Gly Leu Val Val His Asp Ala Gly  
 130 135 140  
 Ala Tyr Cys Met Ser Met Ala Ser Thr Tyr Asn Leu Lys Met Arg Pro  
 145 150 155 160  
 Ala Glu Tyr Trp Val Glu Asp Asp Gly Ser Ile Val Lys Ile Arg His  
 165 170 175  
 Gly Glu Thr Phe Asp Asp Tyr Met Lys Phe Phe Asp Gly Leu Pro Ala  
 180 185 190

<210> 57  
 <211> 526  
 <212> PRT  
 <213> Arabidopsis thaliana

<400> 57  
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 Phe Gly Tyr Gln Ser His Lys Thr Leu Arg Met Ala Ala Ala Thr Gln  
 35 40 45  
 Phe Leu Ser Gln Pro Ser Ser Leu Asn Pro His Gln Leu Lys Asn Gln  
 50 55 60  
 Thr Ser Gln Arg Ser Arg Ser Ile Pro Val Leu Ser Leu Lys Ser Thr  
 65 70 75 80  
 Leu Lys Pro Leu Lys Arg Leu Ser Val Lys Ala Ala Val Val Ser Gln  
 85 90 95  
 Asn Ser Ser Lys Thr Val Thr Lys Phe Asp His Cys Phe Lys Lys Ser  
 100 105 110  
 Ser Asp Gly Phe Leu Tyr Cys Glu Gly Thr Lys Val Glu Asp Ile Met  
 115 120 125

Glu	Ser	Val	Glu	Arg	Arg	Pro	Phe	Tyr	Leu	Tyr	Ser	Lys	Pro	Gln	Ile	
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Thr	Arg	Asn	Leu	Glu	Ala	Tyr	Lys	Glu	Ala	Leu	Glu	Gly	Val	Ser	Ser	
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His	Leu	Arg	Ser	Leu	Gly	Cys	Gly	Ala	Val	Leu	Val	Ser	Gly	Asn	Glu	
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Glu	Ala	Ser	Arg	Ile	Ser	Gly	Lys	Gln	Val	Asn	Val	Leu	Leu	Arg	Ile	
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Asn	Pro	Asp	Val	Asp	Pro	Gln	Val	His	Pro	Tyr	Val	Ala	Thr	Gly	Asn	
			260					265					270			
Lys	Asn	Ser	Lys	Phe	Gly	Ile	Arg	Asn	Glu	Lys	Leu	Gln	Trp	Phe	Leu	
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Asp	Gln	Val	Lys	Ala	His	Pro	Lys	Glu	Leu	Lys	Leu	Val	Gly	Ala	His	
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Cys	His	Leu	Gly	Ser	Thr	Ile	Thr	Lys	Val	Asp	Ile	Phe	Arg	Asp	Ala	
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Ala	Val	Leu	Met	Ile	Glu	Tyr	Ile	Asp	Glu	Ile	Arg	Arg	Gln	Gly	Phe	
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Glu	Val	Ser	Tyr	Leu	Asn	Ile	Gly	Gly	Gly	Leu	Gly	Ile	Asp	Tyr	Tyr	
			340					345					350			
His	Ala	Gly	Ala	Val	Leu	Pro	Thr	Pro	Met	Asp	Leu	Ile	Asn	Thr	Val	
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Arg	Glu	Leu	Val	Leu	Ser	Arg	Asp	Leu	Asn	Leu	Ile	Ile	Glu	Pro	Gly	
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Val	Lys	Thr	Asn	Gly	Thr	Lys	Asn	Phe	Ile	Val	Ile	Asp	Gly	Ser	Met	
				405					410					415		
Ala	Glu	Leu	Ile	Arg	Pro	Ser	Leu	Tyr	Asp	Ala	Tyr	Gln	His	Ile	Glu	
			420					425					430			
Leu	Val	Ser	Pro	Pro	Pro	Ala	Glu	Ala	Glu	Val	Thr	Lys	Phe	Asp	Val	
		435					440					445				



Val Gly Pro Val Cys Glu Ser Ala Asp Phe Leu Gly Lys Asp Arg Glu  
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Leu Pro Thr Pro Pro Gln Gly Ala Gly Leu Val Val His Asp Ala Gly  
 465 470 475 480

Ala Tyr Cys Met Ser Met Ala Ser Thr Tyr Asn Leu Lys Met Arg Pro  
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Ala Glu Thr Phe Asp Asp His Leu Arg Phe Phe Glu Gly Leu  
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<210> 58  
 <211> 1143  
 <212> DNA  
 <213> Oryza sativa

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 aaa 1143

<210> 59  
 <211> 255  
 <212> PRT  
 <213> Oryza sativa

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His Ala Val Ser Ile His Leu Thr Lys Gly Leu Pro Leu Gly Ser Gly  
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 35 40 45

Ala Leu Phe Gly Ser Leu Leu His Gln Asp Asp Leu Val Leu Ala Gly  
 50 55 60



Ser Ile Ser Glu Ile Thr Gly Thr Thr Thr Lys Leu Ser Thr Asn Pro  
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 Leu Arg Asn Cys Ala Gly Ile Ala Ala Ile Ala Thr Met Lys Met Leu  
 115 120 125  
 Gly Ile Arg Ser Val Gly Leu Ser Leu Asp Leu His Lys Gly Leu Pro  
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 Leu Gly Ser Gly Leu Gly Ser Ser Ala Ala Ser Ala Ala Ala Ala Ala  
 145 150 155 160  
 Val Ala Val Asn Glu Ile Phe Gly Arg Lys Leu Gly Ser Asp Gln Leu  
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 Val Leu Ala Gly Leu Glu Ser Glu Ala Lys Val Ser Gly Tyr His Ala  
 180 185 190  
 Asp Asn Ile Ala Pro Ala Ile Met Gly Gly Phe Val Leu Ile Arg Asn  
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 Tyr Glu Pro Leu Asp Leu Lys Pro Leu Lys Phe Pro Ser Asp Lys Asp  
 210 215 220  
 Leu Phe Phe Val Leu Val Ser Pro Glu Phe Glu Ala Pro Thr Lys Lys  
 225 230 235 240  
 Met Arg Ala Ala Leu Pro Thr Glu Ile Pro Met Val His His Val Trp  
 245 250 255  
 Asn Ser Ser Gln Ala Ala Ala Leu Val Ala Ala Val Leu Glu Gly Asp  
 260 265 270  
 Ala Val Met Leu Gly Lys Ala Leu Ser Ser Asp Lys Ile Val Glu Pro  
 275 280 285  
 Thr Arg Ala Pro Leu Ile Pro Gly Met Glu Ala Val Lys Lys Ala Ala  
 290 295 300  
 Leu Glu Ala Gly Ala Phe Gly Cys Thr Ile Ser Gly Ala Gly Pro Thr  
 305 310 315 320  
 Ala Val Ala Val Ile Asp Ser Glu Glu Lys Gly Gln Val Ile Gly Glu  
 325 330 335  
 Lys Met Val Glu Ala Phe Trp Lys Val Gly His Leu Lys Ser Val Ala  
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 Ser Arg  
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<210> 61  
 <211> 1508  
 <212> DNA  
 <213> Zea mays

<400> 61

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<210> 62

<211> 398

<212> PRT

<213> Zea mays

<400> 62

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Pro Ser Leu Val Arg Gly Thr Pro Ala Pro Thr Leu Val Leu Arg Leu
      35              40              45

His Pro Asp Gly Arg Gly His Gly Leu Leu Ala His Thr Gly Pro Ser
      50              55              60

Pro Ser Ser Arg Cys Arg Ala Val Ala Ala Glu Val Gly Gly Leu Asn
      65              70              75              80

Ile Ala Asn Asp Val Thr Gln Leu Ile Gly Asn Thr Pro Met Val Tyr
      85              90              95

Leu Asn Asn Val Val Lys Gly Ser Val Ala Asn Val Ala Ala Lys Leu
      100             105             110

Glu Ile Met Glu Pro Cys Cys Ser Val Lys Asp Arg Ile Gly Tyr Ser
      115             120             125

Met Ile Asn Asp Ala Glu Gln Lys Gly Leu Ile Thr Pro Gly Lys Ser
      130             135             140

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Val	Leu	Val	Glu	Ala	Thr	Ser	Gly	Asn	Thr	Gly	Ile	Gly	Leu	Ala	Phe	145	150	155	160
Ile	Ala	Ala	Ser	Lys	Gly	Tyr	Lys	Leu	Ile	Leu	Thr	Met	Pro	Ser	Ser	165	170	175	
Met	Ser	Met	Glu	Arg	Arg	Val	Leu	Leu	Arg	Ala	Phe	Gly	Ala	Glu	Leu	180	185	190	
Val	Leu	Thr	Asp	Ala	Ala	Lys	Gly	Met	Lys	Gly	Ala	Leu	Asp	Lys	Ala	195	200	205	
Thr	Glu	Ile	Leu	Asn	Lys	Thr	Pro	Asn	Ser	Tyr	Met	Leu	Gln	Gln	Phe	210	215	220	
Asp	Asn	Pro	Ala	Asn	Pro	Gln	Val	His	Tyr	Glu	Thr	Thr	Gly	Pro	Glu	225	230	235	240
Ile	Trp	Glu	Asp	Ser	Lys	Gly	Lys	Val	Asp	Ile	Phe	Ile	Gly	Gly	Ile	245	250	255	
Gly	Thr	Gly	Gly	Thr	Ile	Ser	Gly	Ala	Gly	Arg	Phe	Leu	Lys	Glu	Lys	260	265	270	
Asn	Pro	Gly	Ile	Lys	Val	Ile	Gly	Ile	Glu	Pro	Ser	Glu	Ser	Asn	Ile	275	280	285	
Leu	Ser	Gly	Gly	Lys	Pro	Gly	Pro	His	Lys	Ile	Gln	Gly	Ile	Gly	Ala	290	295	300	
Gly	Phe	Val	Pro	Arg	Asn	Leu	Asp	Ser	Asp	Ile	Leu	Asp	Glu	Val	Ile	305	310	315	320
Glu	Ile	Ser	Ser	Asp	Glu	Ala	Val	Glu	Thr	Ala	Lys	Gln	Leu	Ala	Val	325	330	335	
Gln	Glu	Gly	Leu	Leu	Val	Gly	Ile	Ser	Ser	Gly	Ala	Ala	Ala	Ala	Ala	340	345	350	
Ala	Ile	Lys	Val	Ala	Lys	Arg	Pro	Glu	Asn	Ala	Gly	Lys	Leu	Ile	Val	355	360	365	
Val	Val	Phe	Pro	Ser	Phe	Gly	Glu	Arg	Tyr	Leu	Ser	Ser	Val	Leu	Tyr	370	375	380	
Gln	Ser	Ile	Arg	Glu	Glu	Cys	Glu	Asn	Met	Gln	Pro	Glu	Pro			385	390	395	

<210> 63  
 <211> 1522  
 <212> DNA  
 <213> Oryza sativa

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tctgtcttct tctccgcccg atcgccaaga cagacctcc tcctaccacc tctcgccgc	180
aacctacac tgaccatcca gcccggccc catcccttcc ggaacatcaa ctctcctcc	240
tcctccagct ggatgtgcc cgccgtcgcc gccgaggtcg agggcctcaa catcgccgac	300

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<210> 64  
 <211> 415  
 <212> PRT  
 <213> Oryza sativa

<400> 64

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Ala Arg Gly Ser Asn Tyr Gly Thr Thr Pro Leu Ser Asn Thr Ser Glu
  1                      5                      10                      15

Ser Glu Gln Arg Lys Met Ala Ser Trp Ser Ser Pro Val Ala Ala Ala
                20                      25                      30

Ala Leu Gln Val His Phe Gly Ser Ser Cys Phe Phe Ser Ala Arg Ser
    35                      40                      45

Pro Arg Gln Thr Leu Leu Leu Pro Pro Leu Ala Arg Asn Pro Thr Leu
    50                      55                      60

Thr Ile Gln Pro Arg Pro His Pro Phe Arg Asn Ile Asn Ser Ser Ser
    65                      70                      75                      80

Ser Ser Ser Trp Met Cys His Ala Val Ala Ala Glu Val Glu Gly Leu
                85                      90                      95

Asn Ile Ala Asp Asp Val Thr Gln Leu Ile Gly Lys Thr Pro Met Val
    100                      105                      110

Tyr Leu Asn Asn Ile Val Lys Gly Cys Val Ala Asn Val Ala Ala Lys
    115                      120                      125

Leu Glu Ile Met Glu Pro Cys Cys Ser Val Lys Asp Arg Ile Gly Tyr
    130                      135                      140

Ser Met Ile Ser Asp Ala Glu Glu Lys Gly Leu Ile Thr Pro Gly Lys
    145                      150                      155                      160

Ser Val Leu Val Glu Pro Thr Ser Gly Asn Thr Gly Ile Gly Leu Ala
                165                      170                      175

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Phe Ile Ala Ala Ser Arg Gly Tyr Lys Leu Ile Leu Thr Met Pro Ala  
180 185 190

Ser Met Ser Met Glu Arg Arg Val Leu Leu Lys Ala Phe Gly Ala Glu  
195 200 205

Leu Val Leu Thr Asp Ala Ala Lys Gly Met Lys Gly Ala Val Asp Lys  
210 215 220

Ala Thr Glu Ile Leu Asn Lys Thr Pro Asp Ala Tyr Met Leu Gln Gln  
225 230 235 240

Phe Asp Asn Pro Ala Asn Pro Lys Val His Tyr Glu Thr Thr Gly Pro  
245 250 255

Glu Ile Trp Glu Asp Ser Lys Gly Lys Val Asp Val Phe Ile Gly Gly  
260 265 270

Ile Gly Thr Gly Gly Thr Ile Ser Gly Ala Gly Arg Phe Leu Lys Glu  
275 280 285

Lys Asn Pro Gly Ile Lys Val Ile Gly Ile Glu Pro Ser Glu Ser Asn  
290 295 300

Ile Leu Ser Gly Gly Lys Pro Gly Pro His Lys Ile Gln Gly Ile Gly  
305 310 315 320

Ala Gly Phe Val Pro Arg Asn Leu Asp Ser Glu Val Leu Asp Glu Val  
325 330 335

Ile Glu Ile Ser Ser Asp Glu Ala Val Glu Thr Ala Lys Gln Leu Ala  
340 345 350

Leu Gln Glu Gly Leu Leu Val Gly Ile Ser Ser Gly Ala Ala Ala Ala  
355 360 365

Ala Ala Ile Lys Val Ala Lys Arg Pro Glu Asn Ala Gly Lys Leu Val  
370 375 380

Val Val Val Phe Pro Ser Phe Gly Glu Arg Tyr Leu Ser Ser Ile Leu  
385 390 395 400

Phe Gln Ser Ile Arg Glu Glu Cys Glu Lys Leu Gln Pro Glu Pro  
405 410 415

<210> 65  
<211> 383  
<212> PRT  
<213> Spinacia oleracea

<400> 65  
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Leu Glu Leu Arg Glu Val Lys Asn Leu Ala Asn Phe Arg Val Gly Pro  
20 25 30

Pro Ser Ser Leu Ser Cys Asn Asn Phe Lys Lys Val Ser Ser Ser Pro  
35 40 45





Leu Phe Gln Ser Ile Arg Glu Glu Cys Glu Asn Met Lys Pro Glu  
 370 375 380

<210> 66  
 <211> 386  
 <212> PRT  
 <213> Solanum tuberosum

<400> 66  
 Met Ala Ser Phe Ile Asn Asn Pro Leu Thr Ser Leu Cys Asn Thr Lys  
 1 5 10 15

Ser Glu Arg Asn Asn Leu Phe Lys Ile Ser Leu Tyr Glu Ala Gln Ser  
 20 25 30

Leu Gly Phe Ser Lys Leu Asn Gly Ser Arg Lys Val Ala Phe Pro Ser  
 35 40 45

Val Val Cys Lys Ala Val Ser Val Pro Thr Lys Ser Ser Thr Glu Ile  
 50 55 60

Glu Gly Leu Asn Ile Ala Glu Asp Val Thr Gln Leu Ile Gly Asn Thr  
 65 70 75 80

Pro Met Val Tyr Leu Asn Thr Ile Ala Lys Gly Cys Val Ala Asn Ile  
 85 90 95

Ala Ala Lys Leu Glu Ile Met Glu Pro Cys Cys Ser Val Lys Asp Arg  
 100 105 110

Ile Gly Phe Ser Met Ile Val Asp Ala Glu Glu Lys Gly Leu Ile Ser  
 115 120 125

Pro Gly Lys Thr Val Leu Val Glu Pro Thr Ser Gly Asn Thr Gly Ile  
 130 135 140

Gly Leu Ala Phe Ile Ala Ala Ser Arg Gly Tyr Lys Leu Ile Leu Thr  
 145 150 155 160

Met Pro Ala Ser Met Ser Leu Glu Arg Arg Val Ile Leu Lys Ala Phe  
 165 170 175

Gly Ala Glu Leu Val Leu Thr Asp Pro Ala Lys Gly Met Lys Gly Ala  
 180 185 190

Val Ser Lys Ala Glu Glu Ile Leu Asn Asn Thr Pro Asp Ala Tyr Ile  
 195 200 205

Leu Gln Gln Phe Asp Asn Pro Ala Asn Pro Lys Ile His Tyr Glu Thr  
 210 215 220

Thr Gly Pro Glu Ile Trp Glu Asp Thr Lys Gly Lys Ile Asp Ile Leu  
 225 230 235 240

Val Ala Gly Ile Gly Thr Gly Gly Thr Ile Thr Gly Thr Gly Arg Phe  
 245 250 255

Leu Lys Glu Gln Asn Pro Asn Ile Lys Ile Ile Gly Val Glu Pro Thr  
 260 265 270



<210> 68  
 <211> 470  
 <212> PRT  
 <213> Zea mays

<400> 68

Met	Ala	Val	Ala	Val	Pro	Asn	Ala	Pro	Gly	Arg	Leu	Phe	Leu	Leu	Gln
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Ser	Thr	Pro	Phe	Pro	Asn	Pro	Ser	Ser	Ser	Ala	Ser	Ala	Ala	Arg	Ala
			20					25					30		
Gln	Ser	Phe	Arg	Val	Pro	Pro	Leu	Arg	Leu	Ser	Leu	Phe	Arg	Arg	Met
		35					40					45			
Ala	Gly	Arg	Ser	Leu	Thr	Val	Ile	Ala	Gly	Ala	Ser	Gly	Gly	Ser	Glu
	50					55					60				
Arg	Asp	Leu	Ser	Ala	Ser	Ala	Val	Ser	Val	Glu	Ala	Leu	Asp	Ser	Val
65					70					75					80
Ala	Ser	Asp	Ser	Asp	Leu	Glu	Thr	Lys	Glu	Pro	Ser	Val	Ser	Thr	Met
				85					90					95	
Leu	Thr	Ser	Phe	Glu	Asn	Ser	Phe	Asp	Lys	Tyr	Gly	Ala	Leu	Ser	Thr
			100					105					110		
Pro	Leu	Tyr	Gln	Thr	Ala	Thr	Phe	Lys	Gln	Pro	Ser	Ala	Thr	Asp	Tyr
		115					120					125			
Gly	Thr	Tyr	Asp	Tyr	Thr	Arg	Ser	Gly	Asn	Pro	Thr	Arg	Asp	Val	Leu
	130					135					140				
Gln	Ser	Leu	Met	Ala	Lys	Leu	Glu	Lys	Ala	Asp	Gln	Ala	Phe	Cys	Phe
145					150					155					160
Thr	Ser	Gly	Met	Ala	Ala	Leu	Ala	Ala	Val	Lys	His	Leu	Leu	Gln	Ala
				165					170					175	
Gly	Gln	Glu	Ile	Val	Ala	Gly	Glu	Asp	Ile	Tyr	Gly	Gly	Ser	Asp	Arg
		180						185					190		
Leu	Leu	Ser	Gln	Val	Val	Pro	Arg	Asn	Gly	Ile	Val	Val	Lys	Arg	Val
		195					200					205			
Asp	Thr	Thr	Lys	Ile	Ser	Asp	Val	Val	Ser	Ala	Ile	Gly	Pro	Ser	Thr
	210					215					220				
Arg	Leu	Val	Trp	Leu	Glu	Ser	Pro	Thr	Asn	Pro	Arg	Gln	Gln	Ile	Thr
225					230					235				240	
Asp	Ile	Lys	Thr	Ile	Ser	Glu	Ile	Ala	His	Ser	His	Gly	Ala	Leu	Val
				245					250					255	
Leu	Val	Asp	Asn	Ser	Ile	Met	Ser	Pro	Val	Leu	Ser	Arg	Pro	Ile	Glu
			260					265					270		
Leu	Gly	Ala	Asp	Ile	Val	Met	His	Ser	Ala	Thr	Lys	Phe	Ile	Ala	Gly
	275						280					285			

His Ser Asp Leu Met Ala Gly Ile Leu Ala Val Lys Gly Glu Ser Leu  
 290 295 300  
 Ala Lys Glu Val Gly Phe Leu Gln Asn Ala Glu Gly Ser Gly Leu Ala  
 305 310 315 320  
 Pro Phe Asp Cys Trp Leu Cys Leu Arg Gly Ile Lys Thr Met Ala Leu  
 325 330 335  
 Arg Val Glu Lys Gln Gln Ala Asn Ala Gln Lys Ile Ala Glu Phe Leu  
 340 345 350  
 Ala Ser His Pro Arg Val Lys Gln Val Asn Tyr Ala Gly Leu Pro Asp  
 355 360 365  
 His Pro Gly Arg Ala Leu His Tyr Ser Gln Ala Lys Gly Ala Gly Ser  
 370 375 380  
 Val Leu Ser Phe Leu Thr Gly Ser Leu Ala Leu Ser Lys His Val Val  
 385 390 395 400  
 Glu Thr Thr Lys Tyr Phe Ser Val Thr Val Ser Phe Gly Ser Val Lys  
 405 410 415  
 Ser Leu Ile Ser Leu Pro Cys Phe Met Ser His Ala Ser Ile Pro Ala  
 420 425 430  
 Ser Val Arg Glu Glu Arg Gly Leu Thr Asp Asp Leu Val Arg Ile Ser  
 435 440 445  
 Val Gly Ile Glu Asp Val Glu Asp Leu Ile Ala Asp Leu Asp Arg Ala  
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 Leu Arg Thr Gly Pro Val  
 465 470

<210> 69  
 <211> 1685  
 <212> DNA  
 <213> Oryza sativa

<400> 69  
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 tggctggaat tcttgccgtg aagggtgaaa gcagcttggc taaagagatt gcatttctac 960  
 aaaatgctga aggatcaggt ttggcaccat ttgattgctg gctttgtttg agaggaatca 1020  
 aaaccatggc tttgcgggtg gagaagcagc aggctaagtc tcagaagatt gctgaatttc 1080

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1685

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<210> 70  
 <211> 476  
 <212> PRT  
 <213> Oryza sativa

<400> 70

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Met Ser Ala Ala Ala Ala Ala Ala Ala Ala Ala Ile Pro Thr Ser
  1              5              10              15

Leu Gly Arg Leu Phe His Leu Arg Pro Thr Pro Asn Pro Ser Arg Asn
      20              25              30

Leu Ser Gly Ser Ser Ala Gln Pro Leu Leu Arg Leu Ser Tyr His Pro
      35              40              45

Arg Leu Thr Leu Ser Arg Arg Met Glu Ala Pro Ala Ala Ile Ala Asp
      50              55              60

Ser His Gly Gly Gly Asp Leu Ser Ala Ser Ala Val Gly Ala Glu Ala
      65              70              75              80

Leu Gly Ala Val Ala Ala Pro Asp Phe Asp Val Glu Met Lys Glu Pro
      85              90              95

Ser Val Ala Thr Ile Leu Thr Ser Phe Glu Asn Ser Phe Asp Gly Phe
      100             105             110

Gly Ser Met Ser Thr Pro Leu Tyr Gln Thr Ala Thr Phe Lys Gln Pro
      115             120             125

Ser Ala Thr Asp Asn Gly Pro Tyr Asp Tyr Thr Arg Ser Gly Asn Pro
      130             135             140

Thr Arg Asp Val Leu Gln Ser Leu Met Ala Lys Leu Glu Lys Ala Asp
      145             150             155             160

Gln Ala Phe Cys Phe Thr Ser Gly Met Ala Ala Leu Ala Ala Val Thr
      165             170             175

His Leu Leu Lys Ser Gly Gln Glu Ile Val Ala Gly Glu Asp Ile Tyr
      180             185             190

Gly Gly Ser Asp Arg Leu Leu Ser Gln Val Ala Pro Arg His Gly Ile
      195             200             205

Val Val Lys Arg Ile Asp Thr Thr Lys Ile Ser Glu Val Thr Ser Ala
      210             215             220

```

Ile Gly Pro Leu Thr Lys Leu Val Trp Leu Glu Ser Pro Thr Asn Pro  
 225 230 235 240  
 Arg Leu Gln Ile Thr Asp Ile Lys Lys Ile Ala Glu Ile Ala His Tyr  
 245 250 255  
 His Gly Ala Leu Val Leu Val Asp Asn Ser Ile Met Ser Pro Val Leu  
 260 265 270  
 Ser Arg Pro Leu Glu Leu Gly Ala Asp Ile Val Met His Ser Ala Thr  
 275 280 285  
 Lys Phe Ile Ala Gly His Ser Asp Leu Met Ala Gly Ile Leu Ala Val  
 290 295 300  
 Lys Gly Glu Ser Ser Leu Ala Lys Glu Ile Ala Phe Leu Gln Asn Ala  
 305 310 315 320  
 Glu Gly Ser Gly Leu Ala Pro Phe Asp Cys Trp Leu Cys Leu Arg Gly  
 325 330 335  
 Ile Lys Thr Met Ala Leu Arg Val Glu Lys Gln Gln Ala Asn Ala Gln  
 340 345 350  
 Lys Ile Ala Glu Phe Leu Ala Ser His Pro Arg Val Lys Lys Val Asn  
 355 360 365  
 Tyr Ala Gly Leu Pro Asp His Pro Gly Arg Ser Leu His Tyr Ser Gln  
 370 375 380  
 Ala Lys Gly Ala Gly Ser Val Leu Ser Phe Leu Thr Gly Ser Leu Ala  
 385 390 395 400  
 Leu Ser Lys His Val Val Glu Thr Thr Lys Tyr Phe Asn Val Thr Val  
 405 410 415  
 Ser Phe Gly Ser Val Lys Ser Leu Ile Ser Leu Pro Cys Phe Met Ser  
 420 425 430  
 His Ala Ser Ile Pro Ser Ala Val Arg Glu Glu Arg Gly Leu Thr Asp  
 435 440 445  
 Asp Leu Val Arg Ile Ser Val Gly Ile Glu Asp Ala Asp Asp Leu Ile  
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 Ala Asp Leu Asp His Ala Leu Arg Ser Gly Pro Ala  
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<210> 71

<211> 1699

<212> DNA

<213> Triticum aestivum

<400> 71

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agcttatgat	tatactagaa	gtggcaaccc	tactcgtgat	gttctccaga	gccttatggc	180
taagctcgag	aaggcagacc	aagcattctg	cttcactagt	gggatggcat	cactggctgc	240
agtaacacac	ctccttcagg	ctggacaaga	aatagttgct	ggagaggaca	tatatggtgg	300
ctctgatcgt	ctgctctcac	aagttgtccc	aagaaatgga	attgtagtaa	aacgggtcga	360

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tcatttctcat ggtgcacttg ttttggtgga caacagtatc atgtctccag tgctatcctg 540
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aaaaaaaaaa aaaaaaaaaa

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<210> 72  
 <211> 381  
 <212> PRT  
 <213> *Triticum aestivum*

<400> 72

<400> 2

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His Glu Ser Val Ala Thr Ile Leu Thr Ser Phe Glu Asn Ser Phe Asp
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Lys Tyr Gly Ala Leu Ser Thr Pro Leu Tyr Gln Thr Ala Thr Phe Lys
              20              25              30
Gln Pro Ser Ala Thr Val Asn Gly Ala Tyr Asp Tyr Thr Arg Ser Gly
              35              40              45
Asn Pro Thr Arg Asp Val Leu Gln Ser Leu Met Ala Lys Leu Glu Lys
              50              55              60
Ala Asp Gln Ala Phe Cys Phe Thr Ser Gly Met Ala Ser Leu Ala Ala
              65              70              75              80
Val Thr His Leu Leu Gln Ala Gly Gln Glu Ile Val Ala Gly Glu Asp
              85              90              95
Ile Tyr Gly Gly Ser Asp Arg Leu Leu Ser Gln Val Val Pro Arg Asn
              100             105             110
Gly Ile Val Val Lys Arg Val Asp Thr Thr Lys Ile Asn Asp Val Thr
              115             120             125
Ala Ala Ile Gly Pro Leu Thr Arg Leu Val Trp Leu Glu Ser Pro Thr
              130             135             140

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Asn	Pro	Arg	Gln	Gln	Ile	Thr	Asp	Ile	Lys	Lys	Ile	Ser	Glu	Ile	Ala
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His	Ser	His	Gly	Ala	Leu	Val	Leu	Val	Asp	Asn	Ser	Ile	Met	Ser	Pro
			165						170				175		
Val	Leu	Ser	Trp	Pro	Ile	Glu	Leu	Gly	Ala	Asp	Ile	Val	Met	His	Ser
			180					185					190		
Ala	Thr	Lys	Phe	Ile	Ala	Gly	His	Ser	Asp	Leu	Met	Ala	Gly	Ile	Leu
		195					200					205			
Ala	Val	Lys	Gly	Glu	Ser	Leu	Ala	Lys	Glu	Ile	Ala	Phe	Leu	Gln	Asn
	210					215					220				
Ala	Glu	Gly	Ser	Gly	Leu	Ala	Pro	Phe	Asp	Cys	Trp	Leu	Cys	Leu	Arg
225					230					235					240
Gly	Ile	Lys	Thr	Met	Ala	Leu	Arg	Val	Glu	Lys	Gln	Gln	Asp	Asn	Ala
				245					250					255	
Gln	Lys	Ile	Ala	Glu	Phe	Leu	Ala	Ser	His	Pro	Arg	Val	Lys	Gln	Val
			260					265					270		
Asn	Tyr	Ala	Gly	Leu	Pro	Asp	His	Pro	Gly	Arg	Ser	Leu	His	Tyr	Ser
		275					280					285			
Gln	Ala	Lys	Gly	Ala	Gly	Ser	Val	Leu	Ser	Phe	Gln	Thr	Gly	Ser	Leu
	290					295					300				
Ser	Leu	Ser	Lys	His	Val	Val	Glu	Thr	Thr	Lys	Tyr	Phe	Asn	Val	Thr
305					310					315					320
Val	Ser	Phe	Gly	Ser	Val	Lys	Ser	Leu	Ile	Ser	Leu	Pro	Cys	Phe	Met
				325					330					335	
Ser	His	Ala	Ser	Ile	Pro	Ser	Ser	Val	Arg	Glu	Glu	Arg	Gly	Leu	Thr
		340						345					350		
Asp	Asp	Leu	Val	Arg	Ile	Ser	Val	Gly	Ile	Glu	Asp	Val	Asp	Asp	Leu
		355					360					365			
Ile	Ala	Asp	Leu	Asp	Tyr	Ala	Leu	Arg	Ser	Gly	Pro	Ala			
370						375					380				